

REMARKS

Claims 1-69 are pending. The Office Action dated October 17, 2005 has been carefully considered. The above amendments and the following remarks are presented in a sincere attempt to place this Application in condition for allowance. Claims 13-23, 34-43, 54-63, 65 and 67 have been withdrawn from consideration. Claims 68 and 69 have been added in this Response. Reconsideration and allowance are respectfully requested in light of the following remarks.

Claims 1-5, 8, 11, 25-28, 45-48, 51-52, 64 and 66 stand rejected under 35 U.S.C. § 102(e) in view of U.S. Patent Publication 2004/0166603 to Carley ("Carley"). Insofar as these rejections may be applied against the amended claims they are deemed overcome. Claims 25-28 depend upon and further limit Claim 24. Claims 45-48 and 51-52 depend upon and further limit Claim 44. Therefore, the rejections of these claims will be discussed with the rejections of independent Claims 24 and 44.

Claim 1 comprises a distinguishing feature of claimed invention. The method of Claim 1 describes "depositing a protective material adjacent the housing of structural material overlaying at least one aperture of the housing; and curing the protective material." Support for these features of the claimed invention can be found, among other places, page 9, line 3 through page 10, line 16 of the original Application.

The Carley reference does not teach, suggest, or disclose this feature of the present invention. Specifically, Carley discloses a process for fabricating a microelectromechanical systems ("MEMS") device in a sealed cavity having a multi-layer high strength cap. The process of Carley involves applying a sacrificial layer to protect the MEMS device and then forming a thin-film cap around the MEMS device from a layer of a material characterized by a high strength or stiffness. Holes are etched through this cap layer so that the sacrificial layer can be removed. Once the

MEMS device is released, the holes in the cap layer are sealed by another thin-film cap. This thin-film cap layer of Carley is also characterized by a high strength or stiffness.

In contrast, the claimed invention deposits a protective material overlaying at least one aperture of the housing and then cures this protective material. Accordingly, after the appropriate protective material is applied to the housing, this material is cured or fixed to seal the device. To seal the device, the material is applied in a liquid-phase and is cured or hardened to provide a hermetic barrier. This process is distinct from applying a thin-film cap layer that is characterized by a high strength or stiffness as described in Carley. Carley specifically discloses applying the thin-film cap layer from a gas or plasma phase. Accordingly, when the thin-film cap layer is applied in Carley the material does not have to be and is not cured. Therefore, Carley clearly does not cure the protective material as claimed in Claim 1.

The Examiner states that Carley discloses curing the protective material. In paragraph 0049 Carley discloses “depositing the cap overlayer at a temperature selected to minimize thermal damage to the underlying structure.” This is not curing the protective material (cap overlayer). Carley merely provides a warning that the protective material should not be applied at a temperature that could damage the MEMS device. As previously described, Carley does not disclose curing the protective material because the thin-film cap layer does not have to be and is not cured.

In view of the foregoing, it is apparent that the cited reference does not disclose, teach, or suggest the unique combination now recited in amended Claim 1. Applicants therefore submit that amended Claim 1 is both clearly and precisely distinguishable over the cited references in a patentable sense. Accordingly, Applicants respectfully request that the rejection of Claim 1 under 35 U.S.C. § 102(e) in view of Carley be withdrawn and that amended Claim 1 be allowed.

Claims 2-5, 8 and 11 depend upon and further limit Claim 1. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 2-5, 8 and 11 also be withdrawn.

Claims 64 and 66 comprise the same distinguishing feature as Claim 1. Specifically, Claim 64 describes “curing the protective material,” and Claim 66 describes “allowing or causing the protective layer to harden.” Hence, for at least some of the reasons that Claim 1 is deemed to be allowable Claims 64 and 66 should be deemed to be allowable. Accordingly, Applicants respectfully request that the rejections of Claims 64 and 66 under 35 U.S.C. § 102(e) in view of Carley be withdrawn and that Claims 64 and 66 be allowed.

Claims 12 and 53 stand rejected under 35 U.S.C. § 103(a) in view of Carley. Claim 12 depends upon and further limits independent Claim 1. Hence, for at least the aforementioned reasons, this Claim should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejection of dependent Claim 12 also be withdrawn. Claim 53 depends upon and further limits independent Claim 44. Therefore, the rejection of dependent Claim 53 will be discussed with the rejection of independent Claim 44.

Claims 6-7 and 49-50 stand rejected under 35 U.S.C. § 103(a) in view of Carley and U.S. Patent Publication 2004/0046835 to Yang et al. (“Yang”). Insofar as these rejections may be applied against the amended claims they are deemed overcome. Claims 6-7 depend upon and further limit independent Claim 1. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 6-7 also be withdrawn. Claims 49-50 depend upon and

further limit independent Claim 44. Therefore, the rejections of dependent Claims 49-50 will be discussed with the rejection of independent Claim 44.

Claims 9-10, 24-28, 31-33 and 44 are rejected under 35 U.S.C. § 103(a) in view of Carley and U.S. Patent Publication 2002/0123171 to Farnworth et al. ("Farnworth"). Insofar as these rejections may be applied against the amended claims they are deemed overcome.

Claims 9-10 depend upon and further limit Claim 1. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 9-10 also be withdrawn.

Claim 24 comprises a distinguishing feature of the claimed invention. The method of Claim 24 describes "depositing a protective material adjacent at least a portion of the housing, wherein the protective material at least flows into at least one aperture of the housing, sealing the aperture, but does not flow into at least one of the movable regions of the microscopic device; and curing the protective material." Support for these features of the claimed invention can be found, among other places, page 9, line 3 through page 10, line 16 of the original Application.

The Carley and Farnworth references do not teach, suggest, or disclose this feature of the claimed invention. Specifically, Carley discloses a process for fabricating a MEMS device in a sealed cavity having a multi-layer high strength cap. The process of Carley involves applying a sacrificial layer to protect the MEMS device and then forming a thin-film cap around the MEMS device from a layer of a material characterized by a high strength or stiffness. Holes are etched through this cap layer so that the sacrificial layer can be removed. Once the MEMS device is released, the holes in the cap layer are sealed by another thin-film cap. Farnworth discloses a bond pad that is disposed on a semiconductor device, wherein the semiconductor device may also include a protective overcoat layer.

The method and result disclosed by Farnworth are distinct from the claimed invention. Accordingly, in Farnworth a protective overcoat is formed over the semiconductor wafer. As shown in Fig. 2c of Farnworth the protective overcoat 26 can seep into the notches 22, but in Farnworth this is the undesired result. Specifically, Farnworth teaches away from the protective overcoat seeping into the notches 22. As described in paragraph 0033 of Farnworth, when “protective coat 26 is formed from a material which is not readily removable from notches 22 following deposition and/or curing, a mask is employed to prevent the overcoat material from entering or curing in the notches. Thus, the protective overcoat forms a bond pad opening 28 around each notch 22.” As provided in MPEP § 2141.02, “a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would teach away from the claimed invention.”

In contrast, the claimed invention describes allowing the protective material to flow into the at least one aperture and then curing the protective material, which seals the aperture. This indicates that the protective material is cured in the aperture of the housing. Farnworth avoids allowing the protective overcoat to seal in the aperture. In addition, Carley clearly does not disclose allowing the protective material to flow into an aperture and curing the protective material in the aperture. It is clear that the combined references of Carley and Farnworth teach away from the claimed invention.

In view of the foregoing, it is apparent that the cited references do not disclose, teach, or suggest the unique combination now recited in Claim 24. Applicants therefore submit that Claim 24 is both clearly and precisely distinguishable over the cited references in a patentable sense. Accordingly, Applicants respectfully request that the rejection of Claim 24 under 35 U.S.C. § 103(a) in view of Carley and Farnworth be withdrawn and that amended Claim 24 be allowed.

Claim 44 comprises the same distinguishing feature as Claim 24. Hence, for at least some of the reasons that Claim 24 is deemed to be allowable Claim 44 should be deemed to be allowable. Accordingly, Applicants respectfully request that the rejection of Claim 44 under 35 U.S.C. § 103(a) in view of Carley and Farnworth be withdrawn and that Claim 44 be allowed.

Claims 25-28 and 31-33 depend upon and further limit independent Claim 24. Claims 45-53 depend upon and further limit independent Claim 44. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 25-28, 31-33 and 45-53 also be withdrawn.

Claims 29-30 stand rejected under 35 U.S.C. § 103(a) in view of Carley, Yang, and Farnworth. Insofar as these rejections may be applied against the amended claims they are deemed overcome. Claims 29-30 depend upon and further limit independent Claim 24. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 29-30 also be withdrawn.

Claims 1, 25 and 45 stand rejected under 35 U.S.C. § 103(a) in view of U.S. Patent 6,379,988 to Peterson et al. ("Peterson '988") and U.S. Patent 6,661,084 to Peterson et al. ("Peterson '084"). Insofar as these rejections may be applied against the amended claims they are deemed overcome.

Claim 1 comprises a distinguishing feature of claimed invention. The method of Claim 1 describes "depositing a protective material adjacent the housing of structural material overlaying at least one aperture of the housing; and curing the protective material." Support for these features of

the claimed invention can be found, among other places, page 9, line 3 through page 10, line 16 of the original Application.

The Peterson '988 and the Peterson '084 references do not teach, suggest or disclose this feature of the claimed invention. Specifically, Peterson '988 discloses a method for pre-release plastic packaging of MEMS devices, and Peterson '084 discloses a package with an integral window for housing a MEMS device. In Peterson '988 the packaging of the MEMS device provides an opening wherein a window is placed across the opening to provide an optical view of the MEMS device. In Peterson '084 a window located adjacent to or in the aperture can be fabricated by casting a molten glass or transparent liquid polymer and then curing this glass or polymer. The window of Peterson '084 can only be fabricated if the glass or polymer is fabricated integrally with the housing. Therefore, the glass or polymer must be cured within aperture before the structural material is applied to the MEMS device. This indicates that a sacrificial layer cannot be removed through the aperture if the window is already cured.

In contrast, the claimed invention describes (1) applying a sacrificial material; (2) applying the structural material; (3) creating one or more apertures; (4) removing the sacrificial material while the at least one aperture remains; (5) depositing a protective material overlaying the at least one aperture; and (6) curing the protective material. This is clearly not disclosed by the combination of Peterson '988 and Peterson '084. As disclosed by Peterson '084, the protective material (window) can be cured adjacent to the structural material only if it is fabricated integrally with the structural material. Therefore, the modification described by Peterson '084 would render Peterson '988 unsatisfactory for its purpose. Specifically, if the protective material (window) is fabricated integrally, then the sacrificial layer cannot be removed through the at least one aperture. As provided in MPEP § 2143.01, "if proposed modification would render the prior art invention

being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” The claimed invention describes applying the structural material to the sacrificial layer first, which indicates that the protective layer is not fabricated integrally with the structural material. In addition in the claimed invention, the sacrificial layer is removed through the aperture in the structural material, which indicates that the sacrificial layer must be removed through the aperture before the protective material is deposited.

In view of the foregoing, it is apparent that the cited references do not disclose, teach or suggest the unique combination now recited in amended Claim 1. Applicants therefore submit that amended Claim 1 is both clearly and precisely distinguishable over the cited references in a patentable sense. Accordingly, Applicants respectfully request that the rejection of Claim 1 under 35 U.S.C. § 103(a) in view of Peterson ‘988 and Peterson ‘084 be withdrawn and that Claim 1 be allowed.

Claim 25 depends upon and further limits independent Claim 24. Claim 45 depends upon and further limits independent Claim 44. Hence, for at least the aforementioned reasons, these Claims should be deemed to be in condition for allowance. Accordingly, Applicants respectfully request that the rejections of dependent Claims 25 and 45 also be withdrawn.

New Claims 68 and 69 have been added in this Response. Applicants submit that support for these new claims can be found throughout the original Application. For at least the aforementioned reasons and other reasons clearly apparent, Applicant respectfully request that new Claims 68 and 69 be deemed to be in condition for allowance.

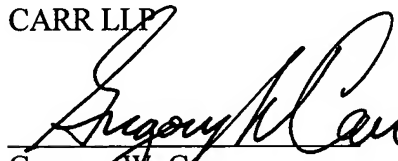
Applicants have not made an earnest attempt to place this Application in condition for allowance. For the foregoing reasons and other reasons clearly apparent, Applicants respectfully request full allowance of Claims 1-12, 24-33, 44-53, 64, 66, 68 and 69.

Applicant hereby requests an extension of time for making this reply and encloses a check in the amount of \$225.00 for the required fee. Applicants do not believe that any other fees are due; however, in the event that any fees are due, the Commissioner is hereby authorized to charge any required fees due (other than issue fees), and to credit any overpayment made, in connection with the filing of this paper to Deposit Account No. 50-0605 of CARR LLP.

Should the Examiner deem that any further amendment is desirable to place this application in condition for allowance, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

CARR LLP


Gregory W. Carr
Reg. No. 31,093

Dated: 3/17/06
CARR LLP
670 Founders Square
900 Jackson Street
Dallas, Texas 75202
Telephone: (214) 760-3030
Fax: (214) 760-3003